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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/074,259

02/14/2002

Seung-Joon Yang

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11/04/2004

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EXAMINER

KOSTAK, VICTOR R

ART UNIT

PAPER NUMBER

2614

DATE MAILED: 11/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/074,259

Applicant(s)

YANG ET AL.

Examiner

Victor R. Kostak

Art Unit

2614

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Art Unit: 2614

1. The disclosure is objected to because of the following informalities: On the first page of applicant's specification, the incorporation by reference a foreign application or patent, is improper. Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

In this specific instance, the attempt to incorporate subject matter into this application by reference to the foreign priority document is improper because since the document has been directly translated into the instant application, it must contain essential subject matter.

On the other hand, if the instant application contains information different from that of the foreign priority document, the instant application would not be entitled to the foreign priority date.

As a better alternative, applicant is advised to delete that statement.

Appropriate correction is required.

2. Claims 4-8 and 13 are objected to because of the following informalities: claim 4 introduces "the *deinterlacing* method of claim 1 ... " whereas all of the other dependent claims only recite the *method* of its base claim. (This is not any serious issue but just a observation of inconsistent language).

Claim 13, on the other hand, excludes reference to a method at all in its dependency

Appropriate correction is required.

Art Unit: 2614

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 10, 12, 13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sezan et al. in view of Hirano et al.

The deinterlacing system of Sezan (noting particularly Figs. 6 and 11) involves estimating motion vectors and their accuracies of a field to be interpolated (for conversion into a progressive format) based on adjacent fields (noting elements 61 – 65); determining the existence or absence of global motion based on the estimation (again element 64); generating a pixel to be interpolated by a first method of motion compensation according to one the estimated vectors and by a second method using spatially adjacent pixels (e.g. col. 6 lines 50-57), and the better pixel indicated by the estimated accuracy as well as the initial global motion estimation is selected as the interpolated pixel.

Sezan uses spatial values for interpolation in his second method (an intrafield method). However, it would have been obvious to one of ordinary skill in the art to use temporal as well as spatial interpolation as disclosed by Hirano (element 2 in Fig. 1: col. 4 lines 14-25), who in a similar deinterlacing system selects between motion vector compensation and adaptive spatiotemporal interpolation based on the amount of motion detected, for the clear benefit of generating a more accurate representation for the interpolated pixel, thereby meeting claims 1 and 16.

As for claim 2, homogeneous fields E1 and E2 are used (elements 61 and 63) in the motion vector estimation.

As for claim 3, estimation of motion vectors involves summation of pixel differences of a block (e.g. col. 6 lines 12-15).

Regarding claim 10, the decision on whether to select between the first and the second interpolation method is based on the global motion estimated image blocks exceeding or not exceeding an inherent motion threshold (e.g. col. 6 lines 28-52).

As for claim 12, in those inevitable instances where there is an indication of no motion, one of the two methods would nonetheless be selected since all pixel blocks regardless of the degree of motion they exhibit must be used to generate a corresponding pixel area in the progressively formatted image. Selection between the two methods in the instance of zero motion would accordingly be based on the motion vector accuracy exceeding or not exceeding an inherent threshold.

It would have been obvious to adjust the threshold value if the incoming pixel data varies from previous data enough to result in less accurate estimates. Hirano in fact discloses threshold adjustment to account for the fact that image data can vary significantly (noting, e.g., Figs. 10, 13A and 14A), thereby meeting claim 13 and 5.

As for claim 17, elements 64 and 65 together function to first identify pixel blocks as exhibiting global motion, and then the accuracy of motion to identify what kind of interpolation, and accordingly what kind of motion, characterized each respective block.

Art Unit: 2614

4. Claims 4-8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sezan et al. in view of Hirano et al., and in further in view of De Haan et al.

De Haan also estimates global motion vectors for applications including deinterlacing (e.g. col. 3 lines 32-33), and points out the benefit of histograms in obtaining identifying most accurate vectors for subsequent application (col. 15 lines 9-20).

In view of this explicit benefit, it would have been obvious to one of ordinary skill in the art to use histograms to identify the optimum motion vector from among a group of estimated vectors, in the system of Sezan as modified by Hirano, as specifically taught in the similar system of De Haan, thereby meeting claims 4 and 18.

As for claim 5, the distribution of motion vectors of Sezan/Hirano would accordingly be represented by a histogram, as disclosed by De Haan.

As for claim 6, the peak value of the histogram distribution indicates the global motion, as so specified by De Haan (noting again col. 15 lines 13-18).

Considering claim 7, there is an inherent threshold set at least at the bare minimum of detectable data, and set higher to disregard unnecessary values, or set even higher to identify at most only one value.

As explained above, it would have been obvious to adjust the threshold value if the incoming pixel data varies from previous data enough to result in less accurate estimates. Hirano in fact discloses threshold adjustment to account for the fact that image data can vary significantly (noting, e.g., Figs. 10, 13A and 14A), thereby meeting claim 8.

Art Unit: 2614

5. Claims 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sezan et al. in view of Hirano et al., and in further view of Bozdagi.

Bozdagi also selects between different interpolation methods to deinterlaces a video signal (e.g. Figs. 5-7), and points out that besides any global motion being present, local motion can also be identified.

It would have been obvious to one of ordinary skill in the art to identify and designate the blocks as exhibiting local (if not global) motion, as taught by Bozdagi, to accurately process the block for interpolation into a sequential format, thereby meeting claim 11. It is noted that although Sezan appears to discuss only global motion, he does in fact identify motion per block which when the image is viewed as a composite block made of contiguous blocks having the same motion accordingly exhibit global motion. When individual blocks exhibit disparate or isolated motion, that is an indication of local motion.

As for claim 14, it would have been obvious to adjust the threshold value if the incoming pixel data varies from previous data enough to result in less accurate estimates. Hirano in fact discloses threshold adjustment to account for the fact that image data can vary significantly (noting, e.g., Figs. 10, 13A and 14A), as discussed above.

6. Claims 9 and 19-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sezan et al. in view of Hirano et al. and De Haan et al., and in further view of Bozdagi

As discussed above, De Haan also estimates global motion vectors for applications including deinterlacing (e.g. col. 3 lines 32-33), and points out the benefit of histograms in obtaining identifying most accurate vectors for subsequent application (col. 15 lines 9-20).

Art Unit: 2614

In view of this explicit benefit, it would have been obvious to one of ordinary skill in the art to use histograms to identify the optimum motion vector from among a group of estimated vectors, in the system of Sezan as modified by Hirano, as specifically taught in the similar system of De Haan.

It would also have been obvious to one of ordinary skill in the art to identify and designate the blocks as exhibiting local (if not global) motion, as taught by Bozdagi, to accurately process the block for interpolation into a sequential format. Likewise it would have been obvious to account for blocks that do not exhibit any motion, thereby accounting for all of the image data that is to be converted, and thereby meeting claims 9 and 19. (As is also explained above, it is noted that although Sezan appears to discuss only global motion, he does in fact identify motion per block which when the image is viewed as a composite block made of contiguous blocks having the same motion accordingly exhibit global motion. When individual blocks exhibit disparate or isolated motion, that is an indication of local motion.)

As for claims 20-25, these situations would all be realized when global/local/zero motion are all to be accounted for, which would have been obvious to one of ordinary skill in the art in order to make sure that all scenarios that can be encountered would indeed be accounted for, the appropriate deinterlacing method being selected according to the motion threshold being exceeded or not.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2614

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor R. Kostak whose telephone number is 703 305-4374. The examiner can normally be reached on Monday - Friday from 6:30am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on 703 305-4795. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Or faxed to:

(703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 308-HELP.

Application/Control Number: 10/074,259
Art Unit: 2614

Page 9

A handwritten signature in black ink, appearing to read 'VRK' with a stylized flourish.

Victor R. Kostak
Primary Examiner
Art Unit 2614

VRK